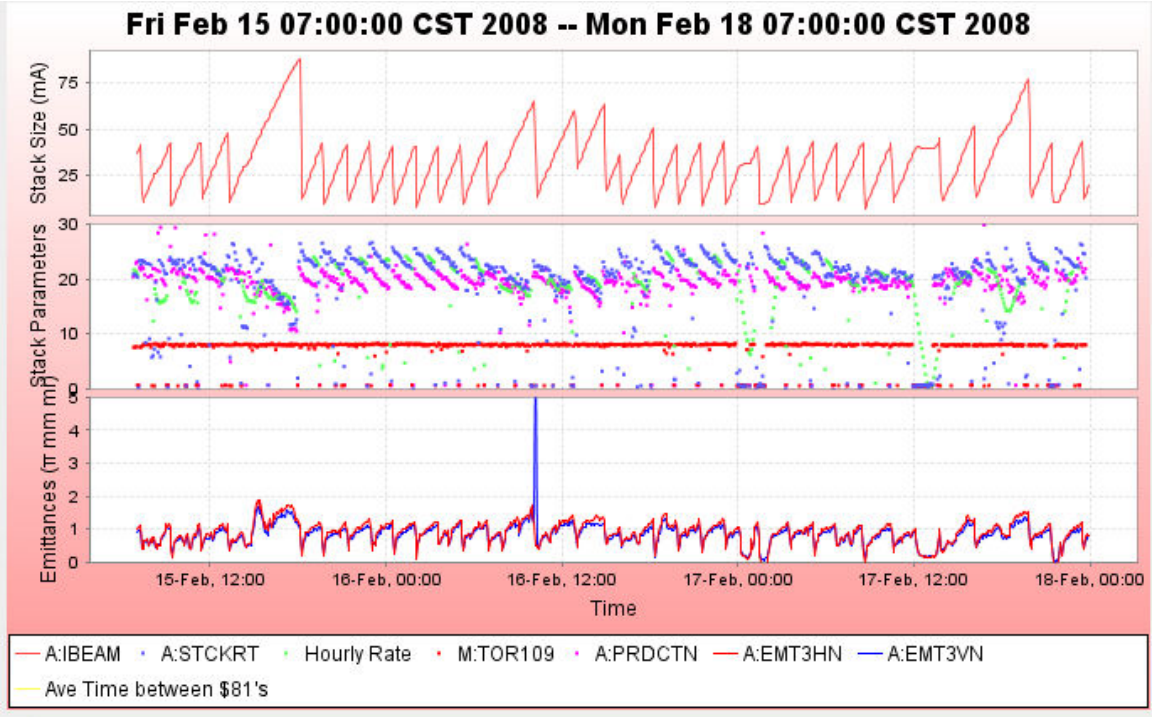
2008-02-18 Monday Morning Pbar Notes

Friday, February 15, 2008
6:49 PM

Stacking

- Protons on Target
  - Ran an average of 7.4e12 at 11 turns for most of the weekend.
  - Starting early afternoon, intensity slowly started to decrease to about 7.3e12 by the start of day shift today
- Best stacking hours over the weekend were 23.58, 24.21 and 22.96mA/hr on Friday, Saturday and Sunday respectively.
- Average Productions were 17, 17, 17.8 e-6/proton on Friday, Saturday and Sunday respectively.
- Over the last 24-36 hours, stack rate is down about 1mA/hr and production is up slightly. Some of this can be attributed to reduced beam on target, but not all. We will work on tuning up stacking today to get our rates back up.
- We are also looking at why we are taking a bigger hit than normal when $21 or studies events are in the TLG.
  - There is some AP1 and AP2 orbit drifting during periods when the orbit correction program is not running (during and after $21s and other studies events).
  - We will continue to pursue this today.
- Unofficially, set another stacking record for the week.
  - 3,000.7mA stacked from Monday Midnight to Monday Midnight.
  - We will double check this number closer. The official keeper of this number is on furlough.



Transfers

- Transferred 1,306mA to the Recycler in 109 transfers over 36 sets.
  - Accumulator to Main Injector Efficiency = 96%

        - Accumulator to RR Efficiency 87.6%
    - Transfer Efficiencies lower
        - The vertical closure on the first transfer has wandered. The sequencer "Fudge Factors" were changed to compensate. The fudge factors are in place to account for any differences between the reverse protons used for tune-up and the pbars going out during the transfers. In theory there should be no difference, but in reality there is a small difference which we compensate for. This small change was not a significant component of the lower transfer efficiencies.
        - Accumulator emittances were also not to blame.
        - There were two main factors that contributed to the lower transfer efficiencies.
            - Saturday transfers (7188 to 7199) were less efficient due to RR damper issues.
            - Transfer 7200 was only 75% efficient. This was due to the Recycler DP sig 90% (R:DP90A) being too high for efficient transfers. DP Sig 90% was 13.84, and needs to be 12 or lower for efficient transfers. For more details, see Recycler experts on this one.

Column 1 Number_0_Pbar	Column 4 Number_3_Transfer Time		Column 21 Number_20_A:IBEAMB sampled	Column 22 Number_21_A:IB	Unstacked (mA)	Column 23 Number_22_R:BE	Column 24 Number_23_R:BE	Stashed	Acc to RR Eff	Column 27 Number_26_MI	Column 28 Number_27_MI Before	Acc to MI Eff	Acc to MI2 Eff	Transfers	Sets
	2/18/2008	7:00:00 AM			1306.600			1144.67	87.61%	1254.302	1250.181	96.00%	95.68%	109	36
7213	Monday, February 18, 2008	5:45:12 AM	42.188	10.188	32.000	211.372	240.413	29.04	90.75%	31.131	31.213	97.28%	97.54%	3	1
7212	Monday, February 18, 2008	4:10:25 AM	43.788	10.388	33.400	182.104	212.136	30.03	89.92%	32.041	32.163	95.93%	96.30%	3	1
7211	Monday, February 18, 2008	2:33:19 AM	41.788	10.388	31.400	154.189	182.369	28.18	89.75%	29.872	30.027	95.13%	95.63%	3	1
7210	Monday, February 18, 2008	1:02:04 AM	42.188	10.188	32.000	125.230	154.597	29.37	91.77%	30.864	31.464	96.45%	98.33%	3	1
7209	Sunday, February 17, 2008	11:28:41 PM	43.388	10.788	32.600	95.946	125.297	29.35	90.03%	31.010	32.217	95.12%	98.83%	3	1
7208	Sunday, February 17, 2008	9:22:45 PM	42.188	10.388	31.800	67.599	96.457	28.86	90.75%	30.500	31.122	95.91%	97.87%	3	1
7207	Sunday, February 17, 2008	7:50:38 PM	76.988	11.388	65.600	10.656	68.251	57.60	87.80%	61.742	61.350	94.12%	93.52%	4	1
7206	Sunday, February 17, 2008	4:08:17 PM	51.788	12.388	39.400	335.096	370.825	35.73	90.68%	37.534	36.562	95.26%	92.80%	3	1
7205	Sunday, February 17, 2008	1:48:00 PM	44.988	10.388	34.600	305.339	337.349	32.01	92.51%	33.641	32.940	97.23%	95.20%	3	1
7204	Sunday, February 17, 2008	10:29:33 AM	43.188	10.388	32.800	278.944	307.953	29.01	88.44%	31.272	30.844	95.34%	94.04%	3	1
7203	Sunday, February 17, 2008	8:34:59 AM	42.588	7.388	35.200	248.297	281.063	32.77	93.09%	34.819	33.819	98.92%	96.08%	3	1
7202	Sunday, February 17, 2008	6:41:34 AM	42.188	10.388	31.800	220.166	249.353	29.19	91.78%	30.593	31.092	96.20%	97.77%	3	1
7201	Sunday, February 17, 2008	5:08:58 AM	43.788	10.987	32.801	191.260	221.126	29.87	91.05%	32.085	31.927	97.82%	97.34%	3	1
7200	Sunday, February 17, 2008	3:28:48 AM	41.388	9.988	31.400	169.207	192.584	23.38	74.45%	30.464	30.111	97.02%	95.89%	3	1
7199	Sunday, February 17, 2008	1:23:03 AM	41.588	9.988	31.600	140.839	169.464	28.63	90.59%	30.500	31.064	96.52%	98.30%	3	1
7198	Saturday, February 16, 2008	11:04:19 PM	43.188	7.988	35.200	109.671	141.202	31.53	89.58%	33.276	32.530	94.53%	92.41%	3	1
7197	Saturday, February 16, 2008	9:27:14 PM	42.588	9.188	33.400	78.859	110.112	31.25	93.57%	32.715	31.856	97.95%	95.38%	3	1
7196	Saturday, February 16, 2008	7:51:19 PM	42.588	9.788	32.800	49.368	79.272	29.90	91.17%	31.596	32.064	96.33%	97.76%	3	1
7195	Saturday, February 16, 2008	6:14:06 PM	50.788	8.388	42.400	12.447	49.956	37.51	88.46%	40.332	39.812	95.12%	93.90%	4	1
7194	Saturday, February 16, 2008	3:58:23 PM	36.188	8.988	27.200	366.748	391.001	24.25	89.17%	25.989	26.205	95.55%	96.34%	3	1
7193	Saturday, February 16, 2008	2:54:43 PM	63.788	16.788	47.000	326.939	368.565	41.63	88.57%	44.515	43.874	94.71%	93.35%	3	1
7192	Saturday, February 16, 2008	12:55:29 PM	59.988	28.588	31.400	300.541	329.176	28.64	91.19%	29.987	29.684	95.50%	94.54%	2	1
7191	Saturday, February 16, 2008	10:08:26 AM	64.388	12.388	52.000	298.337	323.838	25.50	49.04%	49.848	48.759	95.86%	93.77%	3	1
7190	Saturday, February 16, 2008	6:53:33 AM	43.788	8.988	34.800	278.850	304.738	25.89	74.39%	33.045	33.196	94.96%	95.39%	3	1
7189	Saturday, February 16, 2008	5:09:26 AM	42.188	8.788	33.400	255.446	281.287	25.84	77.37%	32.115	32.422	96.15%	97.07%	3	1
7188	Saturday, February 16, 2008	3:32:13 AM	41.188	9.788	31.400	230.522	257.699	27.18	86.55%	29.724	29.460	94.66%	93.82%	3	1
7187	Saturday, February 16, 2008	1:59:53 AM	40.788	8.388	32.400	201.641	231.071	29.43	90.83%	31.456	31.382	97.09%	96.86%	3	1
7186	Saturday, February 16, 2008	12:29:24 AM	41.988	9.388	32.600	173.348	202.604	29.26	89.74%	30.968	31.479	94.99%	96.56%	3	1

7185	Friday, February 15, 2008	10:55:50 PM	43.788	9.588	34.200	143.389	174.090	30.70	89.77%	32.713	32.814	95.65%	95.95%	3	1
7184	Friday, February 15, 2008	9:20:05 PM	42.188	10.188	32.000	114.334	143.721	29.39	91.83%	30.593	29.779	95.60%	93.06%	3	1
7183	Friday, February 15, 2008	7:40:15 PM	42.588	8.588	34.000	82.254	114.804	32.55	95.74%	33.144	33.996	97.48%	99.99%	3	1
7182	Friday, February 15, 2008	6:08:32 PM	88.188	11.587	76.601	14.193	83.344	69.15	90.27%	73.677	73.273	96.18%	95.66%	4	1
7181	Friday, February 15, 2008	1:13:18 PM	48.188	9.788	38.400	343.516	376.929	33.41	87.01%	36.651	36.112	95.45%	94.04%	3	1
7180	Friday, February 15, 2008	11:23:11 AM	42.787	12.188	30.599	316.830	345.618	28.79	94.08%	29.808	29.148	97.41%	95.26%	2	1
7179	Friday, February 15, 2008	9:16:21 AM	42.387	8.988	33.399	288.479	318.686	30.21	90.44%	32.228	32.354	96.49%	96.87%	3	1
7178	Friday, February 15, 2008	7:16:20 AM	41.588	8.588	33.000	259.951	289.623	29.67	89.92%	31.854	32.067	96.53%	97.17%	3	1

Studies

- Did one round of fixing the vertical orbit for Transfers. The changes didn't work, so they were put back. Later careful analysis of the model showed a subtle error. This is understood, and experts are ready to try again.

Requests

- 5-10 minutes to tune-up the beamlines prior to a set of transfers.
- If today's extended Tevatron access that does not currently include F-Sector is expanded to include F-Sector, we have 3-4 hours of target station work that could be done.
  - After talking to Tony, they could use any 2 hour or greater period of time.

Other Notes

Friday:

- 16:11:28- We had a problem with the front end TWTACC being hung up. It was not reporting data to the stacktail monitor which caused the program to not make the appropriate changes to the stacktail power. DVM spoke with Dennis Nicholas (the FE keeper)who was not able to log into the FE. He had us reboot TWTACC, which in turn tripped off a number of stacktail and 2-4 TWTs. We have not been able to turn on Stacktail TWT A:SPTW19 since the trip.
  - -- Fri Feb 15 17:08:17 comment by...clb -- Stacktail Momentum TWT 19 has died. The alarms have been bypassed and placed in the DEAD TWT alarm list on D59.
- 16:21:03- PBAR FE was reporting errors. Rebooted.
- 16:45:08- After the PBAR front end was rebooted, D:TGTY came into alarm for some reason. The target position was moved this morning, so I guess either the alarm was bypassed before and then became unbypassed after the reboot, or it was renominalized before but for some reason the nominalization didn't stick after the reboot. At any rate, I have renominalized the D:TGTY alarm.
- Fri Feb 15 17:19:22 comment by...clb -- D:IKIK module adjustment. ...The D:FLXBTL plots have been rather messy lately, and hence not terribly useful.

- Paul's Numbers
  - Saturday
    - Most in an hour: 23.58 mA at Sat Feb 16 03:05:14 CST 2008
    - Best: 25.19 mA on 30-Jan-08
    - Average Production 17.06 e-6/proton Best: 25.41 e-6/proton on 01/30/2008
    - Average Protons on Target 7.00 e12 Best: 8.77 e12 on 07/24/2007
    - Largest Stack 88.28 mA Best: 271.01 mA on 11/14/2007
  - Sunday
    - Most in an hour: 24.21 mA at Sat Feb 16 19:22:00 CST 2008
    - Best: 25.19 mA on 30-Jan-08
    - Average Production 17.09 e-6/proton Best: 25.41 e-6/proton on 01/30/2008
    - Average Protons on Target 7.22 e12 Best: 8.77 e12 on 07/24/2007
    - Largest Stack 64.36 mA Best: 271.01 mA on 11/14/2007

        - Largest Stack 64.36 mA Best: 271.01 mA on 11/14/2007
    - Monday
        - Most in an hour: 22.96 mA at Mon Feb 18 02:07:19 CST 2008
        - Best: 25.19 mA on 30-Jan-08
        - Average Production 17.81 e-6/proton Best: 25.41 e-6/proton on 01/30/2008
        - Average Protons on Target 7.14 e12 Best: 8.77 e12 on 07/24/2007
        - Largest Stack 76.82 mA Best: 271.01 mA on 11/14/2007

- Al's numbers
    - Stacking
        - Pbars stacked: 1292.52 E10
        - Time stacking: 65.69 Hr
        - Average stacking rate: 19.68 E10/Hr

    - Uptime
        - Number of pulses while in stacking mode: 101107
        - Number of pulses with beam: 93866
        - Fraction of up pulses was: 92.84%

    - The uptime's effect on the stacking numbers
        - Corrected time stacking: 60.98 Hr
        - Possible average stacking rate: 21.19 E10/Hr

    - Recycler Transfers
        - Pbars sent to the Recycler: 1293.00 E10
        - Number of transfers : 109
        - Number of transfer sets: 36
        - Average Number of transfer per set: 3.03
        - Time taken to shoot: 04.96 Hr
        - Time per set of transfers: 08.26 min
        - Transfer efficiency: 89.05%

    - Other Info
        - Average POT : 7.36 E12
        - Average production: 18.70 pbars/E6 protons
- Monday Midnight to Monday Midnighrt
    - Stacking
    - Pbars stacked: 3000.70 E10
    - Time stacking: 152.77 Hr
    - Average stacking rate: 19.64 E10/Hr

    - Uptime
    - Number of pulses while in stacking mode: 237173
    - Number of pulses with beam: 220878
    - Fraction of up pulses was: 93.13%

    - The uptime's effect on the stacking numbers
    - Corrected time stacking: 142.27 Hr
    - Possible average stacking rate: 21.09 E10/Hr

    - Recycler Transfers
    - Pbars sent to the Recycler: 3007.09 E10
    - Number of transfers : 249
    - Number of transfer sets: 82
    - Average Number of transfer per set: 3.04
    - Time taken to shoot: 12.08 Hr
    - Time per set of transfers: 08.84 min
    - Transfer efficiency: 78.07%

- Other Info
- Average POT : 7.39 E12
- Average production: 18.39 pbars/E6 protons

- Numbers for Salah - 4 8 15 16 23 42
-

SP Momentum TWT 19 is broke.

Pbar Heat Exchanger Update

Just wanted to fill everyone in on the PBar heat exchanger status. We are currently operating off the Plate and Frame Heat Exchanger (HE9). The pressure drop across the heat exchanger is about 12 psi and rising. This indicates that there is some blockage and we would like to clean it. In order to clean it, we would need to switch to the Shell and Tube Heat Exchanger (HX8). Recent events have shown us that the Shell and Tube Heat Exchanger has a significant leak and cannot be used as a backup until we fix it. We are vulnerable while we continue to run on the Plate and Frame Heat Exchanger, but we don't have an option at this time. Time is ticking but FESS has a plan.....

Monday, Feb. 18th

FESS will try to contact a contractor to work on repair of the Shell and Tube Heat Exchanger. It is a holiday for some so this may not happen until Tuesday.

Tuesday - Thursday

The contractor will work on and repair the Shell and Tube Heat Exchanger.

Friday, Feb. 22nd

The Shell and Tube will be ready, but needs to have LCW run through it and

polished. (overnight)
Monday, Feb. 25th
The Shell and Tube will be a viable backup and we can look at taking the Plate and Frame off line for cleaning. It
will take 2-3 days to clean the heat exchanger.
Good Luck, Dan